



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,698	09/15/2003	Steven R. Smith	99-0866.3	9778
22823	7590	09/22/2004	EXAMINER	
STEPHEN A GRATTON THE LAW OFFICE OF STEVE GRATTON 2764 SOUTH BRAUN WAY LAKEWOOD, CO 80228			NGUYEN, DILINH P	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/662,698

Applicant(s)

SMITH, STEVEN R.

Examiner

DiLinh Nguyen

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 57,58 and 60-82 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 57,58 and 60-82 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/21/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 57 and 63 are rejected under 35 U.S.C. 102(b) as being anticipated by Kennedy (U.S. Pat. 3778685).

- Regarding claim 57, Kennedy discloses a semiconductor device comprising:
a leadframe 15;
a die 12 on the leadframe; and
a plastic body comprising a first polymer member 13 (column 4, lines 67-68) on the die or the leadframe, and a second polymer member 14 (column 2, line 44 or column 3, lines 20-25) encapsulating the first polymer member, the first polymer member having a selected geometry configured to provide substantially equal volumes of the second polymer member on either side of the leadframe (fig. 2, column 2, lines 41 et seq.).
- Regarding claim 63, Kennedy discloses the first polymer member 13 encapsulates the die (fig. 2).

3. Claims 71-72, 74 and 77 are rejected under 35 U.S.C. 102(b) as being anticipated by Fierkens (U.S. Pat. 4250347).

Fierkens discloses a semiconductor device comprising:

Art Unit: 2814

a lead frame 1 having a first side and a second side;
a die on the leadframe;
a polymer member 16 on the die or the leadframe; and
a plastic body 11 or 8 comprising a molding compound encapsulating the polymer member and at least a portion of the leadframe, the plastic body having a first portion on the first side having a first volume and a second portion on the second side having a second volume;
the polymer member configured to equalize the first volume and the second volume (fig. 5, column 3, lines 41-55).

- Regarding claim 72, Fierkens discloses the polymer member comprises a material selected from the group consisting of epoxy (column 1, lines 28).
- Regarding claim 74, Fierkens discloses the polymer member 16 encapsulates the die (fig. 5).
- Regarding claim 77, Fierkens discloses the polymer member 16 comprises the molding compound (fig. 6).

4. Claims 71, 73 and 75-76 are rejected under 35 U.S.C. 102(e) as being anticipated by Inaba (U.S. Pat. 6093958).

Inaba discloses a semiconductor device comprising:

a lead frame 31 having a first side and a second side;
a die 1B on the leadframe;
a polymer member 4 or 9 on the die or the leadframe; and

a plastic body 6 comprising a molding compound encapsulating the polymer member and at least a portion of the leadframe, the plastic body having a first portion on the first side having a first volume and a second portion on the second side having a second volume;

the polymer member configured to equalize the first volume and the second volume (fig. 8, column 4, lines 7 et seq. and column 5, lines 50-55).

- Regarding claim 73, Inaba discloses the polymer member 4 or 9 comprises a tape material (fig. 8).
- Regarding claim 75, Inaba discloses the leadframe has a lead on chip configuration (fig. 8, column 6, line 13).
- Regarding claim 76, Inaba discloses the die 1B is attached and wire bonded 5 to the leadframe (fig. 8).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 58, 60-61, 64, 65-70, 78-82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kennedy (U.S. Pat. 3778685) in view of Ishikawa et al. (U.S. Pat. 5394014).

Art Unit: 2814

- Regarding claims 58, 65 and 78, Kennedy substantially discloses all the limitations for the claimed invention except for not specifically point out that the first polymer member includes a filler.

Ishikawa et al. discloses a semiconductor device comprising: the first polymer member 1 includes a filler configured to provide a selected characteristic of the package (fig. 4, column 5, lines 3-5). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Kennedy by having a filler with the structure as set forth above because as taught by Ishikawa et al., such filler into the polymer member such as epoxy resin would provide a highly reliable semiconductor device, which is improved in light shielding property (column 6, lines 17-20).

- Regarding claims 60 and 79, Ishikawa et al. disclose the first polymer member 1 includes a filler configured to provide an increase rigidity for the package (fig. 4, column 5, lines 3-5 and column 6, lines 17-20).
- Regarding claim 61, Ishikawa et al. disclose the first polymer member 1 comprises an epoxy resin (column 5, line 4).
- Regarding claim 64, Ishikawa et al. disclose the first polymer member 1 and the second polymer member 31 comprise a same molding compound (column 5, lines 25-28).
- Regarding claims 66 and 80, Kennedy discloses the selected geometry provides substantially equal volumes of a molding compound of the second polymer member of either side of the lead frame (fig. 2).

Art Unit: 2814

- Regarding claims 67-68, Kennedy in view of Ishikawa et al. disclose the semiconductor package wherein the selected geometry and the filler are configured to reduce a package bow or package warpage (figs. 2 and 4, respectively).
- Regarding claims 69-70, Ishikawa et al. disclose the first polymer member and the second polymer member comprise a same molding compound (column 5, lines 25-28) and same molded plastic (column 5, line 4).
- Regarding claim 81, Kennedy discloses wherein the first polymer member 13 substantially encapsulates the die (fig. 2).
- Regarding claim 82, Kennedy discloses the second polymer member 14 substantially encapsulates the first polymer member (fig. 2).

7. Claim 62 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kennedy in view of Inaba (U.S. Pat. 6093958).

Kennedy fails to disclose the first polymer member comprises a tape material.

Inaba discloses a semiconductor device (cover fig.) comprising: a lead frame; a tape material 4 on the die and the lead frame, a sealing resin layer 6 encapsulating the tape material. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Kennedy to assure in quality and reliability for the lead frame and to reduce the thermal resistance, as shown by Inaba (column 6, lines 1-5).

Response to Arguments

Applicant's arguments with respect to claims 65-82 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments with respect to claims 57-64 filed 6/21/04 have been fully considered but they are not persuasive.

Kennedy fails to disclose the plastic cover 14 is symmetrical and has a equal volume of material on an upper side of the lead frame array 11 relative to the lower side thereof.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the first polymer member having a selected geometry configured to provide equal volumes of the second polymer member on either side of the leadframe) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Claim 57 comprises the first polymer member having a selected geometry configured to provide **substantially** equal volumes of the second polymer member on either side of the leadframe.

- Kennedy discloses a semiconductor device comprising:
 - a leadframe 15;
 - a die 12 on the leadframe; and

Art Unit: 2814

a plastic body comprising a first polymer member 13 (column 4, lines 67-68) on the die or the leadframe, and a second polymer member 14 (column 2, line 44 or column 3, lines 20-25) encapsulating the first polymer member, the first polymer member having a selected geometry configured to provide substantially equal volumes of the second polymer member on either side of the leadframe (fig. 2, column 2, lines 41 et seq.).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

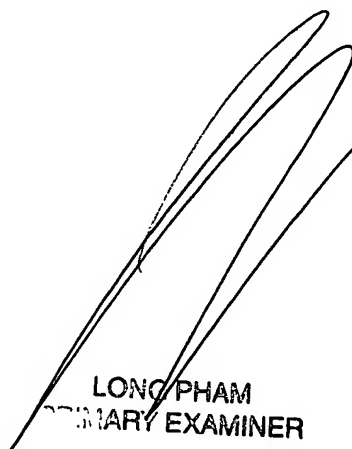
Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (571) 272-1712. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

Art Unit: 2814

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DLN



LONG PHAM
PRIMARY EXAMINER